REMARKS

Claims 3, 4, 7, 9-11 and 16-22 are pending in this application. By this Amendment, claim 4 is amended. Support for the amendment to claim 4 can be found in the specification as originally filed, for example, at page 26, lines 2-20. No new matter is added by this amendment.

Applicants appreciate the courtesies shown to Applicants' representative by Examiner Chaney in the January 5 personal interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks. However, as discussed during the January 5 personal interview, Applicants respectfully request that Examiner Le contact Applicants' undersigned representative prior to acting on this case.

I. Claim Rejection Under 35 U.S.C. §103

The Office Action rejects claims 3, 4, 7, 9-11 and 16-22 under 35 U.S.C. §103(a) over Japanese Patent Publication No. JP 2001-000860 to Naoki in view of U.S. Patent No. 5,476,665 to Dennison. Applicants respectfully traverse this rejection.

Independent claim 3 sets forth, in pertinent part, "a functional particle preparing method comprising steps of: treating either one of a hollow particle or a porous particle having a pore on the surface thereof by plasma irradiation …, graft polymerizing at least one type of monomer onto the surface of the plasma irradiated particle by contacting the at least one type of monomer with the surface of the plasma irradiated particle so as to substantially fill the pore of said particle with grafted polymers of said monomer; soaking said graft polymerized particle in a solution having an inclusion to be inserted into said graft polymerized particle, where the solution having the inclusion is adjusted such that the grafted polymers shrink to form openings that allow said inclusion to pass into said pore or through said pore into a cavity region within said particle; adjusting the solution having the inclusion such that the grafted polymers expand to close said openings and to prevent said inclusion

from passing through said pore such that a functional particle having inclusion impregnated therein is obtained." Claims 7, 10, 11 and 16-22 depend from independent claim 3 and incorporate all of the limitations thereof. Independent claim 4, from which claim 9 depends, sets forth a functional particle obtained by a process including these features of claim 3.

Naoki teaches gas-absorbing materials that are prepared using plasma irradiation and graft polymerization. *See* Naoki, Abstract. Specifically, Naoki discloses methods for producing gas-absorbing materials from porous materials, such as zeolites and silica gels, in which the pore walls are subjected to plasma irradiation. *See* Naoki, paragraphs [0009], [0014], [0016]. The plasma irradiation adjusts the pore size, and the pore diameter may also be controlled by graft polymerization within the pores. *Id.*

However, Naoki does not teach, nor does it suggest, impregnating its particles with inclusions to form functional particles, as admitted by the Office Action. In particular, Naoki does not disclose or suggest incorporating an inclusion by "soaking said graft polymerized particle in a solution having an inclusion to be inserted into said graft polymerized particle, where the solution having the inclusion is adjusted such that the grafted polymers shrink to form openings that allow said inclusion to pass into said pore or through said pore into a cavity region within said particle; adjusting the solution having the inclusion such that the grafted polymers expand to close said openings and to prevent said inclusion from passing through said pore such that a functional particle having inclusion impregnated therein is obtained," as set forth in claims 3 and 4. The combination of Naoki with Dennison does not remedy this shortcoming of Naoki.

Dennison discloses methods for forming included membranes by solvent phase inversion. *See* Dennison, Abstract. Solvent phase inversion is a membrane formation process in which polymers are dissolved in a solvent, shaped into a desired membrane shape, and precipitated out of solution to form the membrane. *See* Dennison, col. 5, lines 18-23.

Azlactone functional particles are included in the polymer solution, and are included in the membrane when the polymer is precipitated. *See* Dennison, col. 6, lines 43-60; Examples.

However, Dennison also does not teach or suggest incorporating an inclusion by "soaking said graft polymerized particle in a solution having an inclusion to be inserted into said graft polymerized particle, where the solution having the inclusion is adjusted such that the grafted polymers shrink to form openings that allow said inclusion to pass into said pore or through said pore into a cavity region within said particle; adjusting the solution having the inclusion such that the grafted polymers expand to close said openings and to prevent said inclusion from passing through said pore such that a functional particle having inclusion impregnated therein is obtained," as set forth in claims 3 and 4. Rather, Dennison requires that copolymers for forming a membrane be dissolved in a solvent including functional particles and precipitated out of solution to form the membrane.

In addition, the combination of Naoki and Dennison would not yield the claimed method or functional particles. The pending claims set forth shrinking and expanding graft copolymers in the pores to incorporate inclusions in functional particles, not dissolution of the polymers. The combination of Naoki and Dennison would yield a method for preparing functional particles in which the particles are subjected to plasma irradiation to adjust pore size, the pores are graft polymerized to further control pore size, and then the polymers are dissolved in a solution containing inclusions and precipitated. This process incorporates inclusions in a different manner than the method of claim 3, and would result in particles unlike the particles of claim 4.

Further, neither Naoki nor Dennison provides any motivation to modify the Dennison method to adjust the inclusion-containing solution to shrink and expand the graft copolymers. Naoki does not disclose or suggest incorporating inclusions into its graft copolymers and thus cannot provide such motivation. Dennison also does not provide such motivation, because

Dennison discloses only solvent phase inversion methods. Dennison does not teach or suggest the use of swellable polymer materials in its membranes, and therefore does not provide any motivation to incorporate inclusions into swellable polymers.

In addition, the claimed method and functional particles provide advantages not suggested by the cited references. For example, the claimed method and functional particles allow easy preparation of microcapsules, because inclusions can be confined in pores or cavities by simple adjustments to solution temperature or pH. *See* specification, page 7, lines 5-19; page 31, lines 7-12; Figs. 8-15.

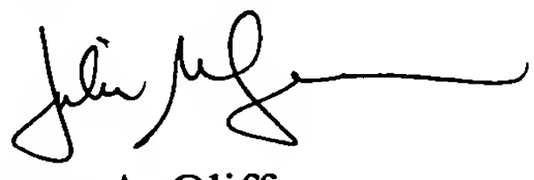
For at least the reasons set forth above, claims 3 and 4, and their dependent claims, are patentable over the combination of Naoki and Dennison. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 3, 4, 7, 9-11 and 16-22 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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